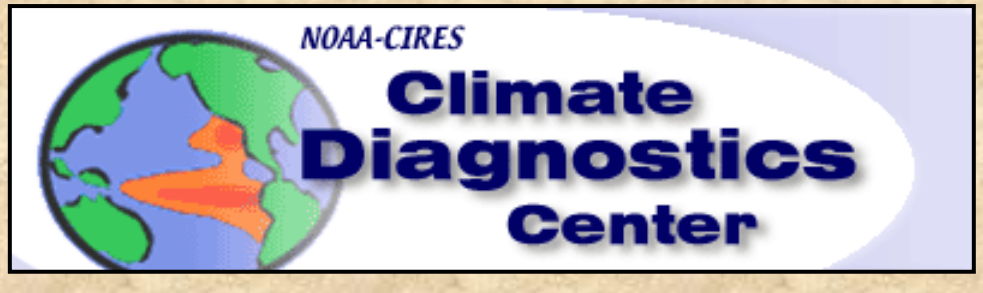

Seasonal Outlook into late winter

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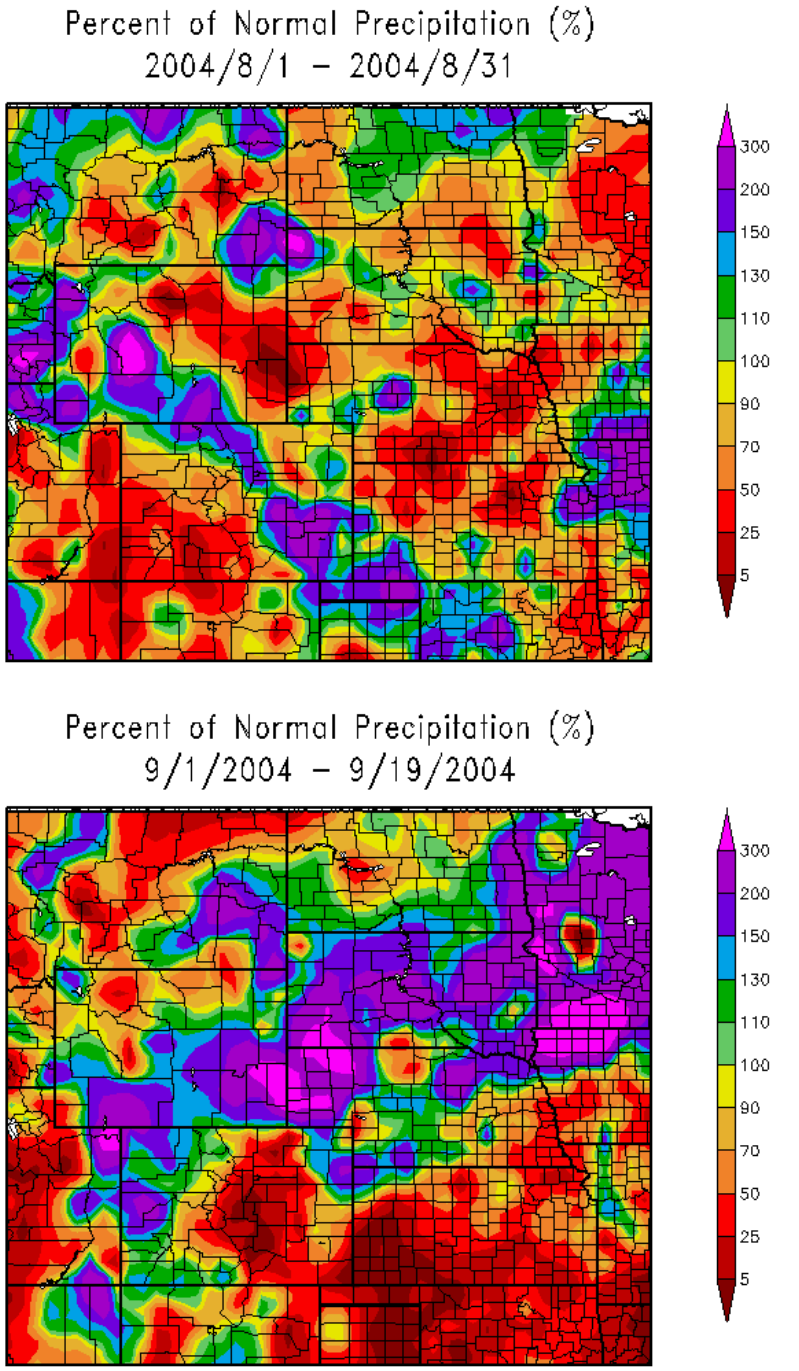
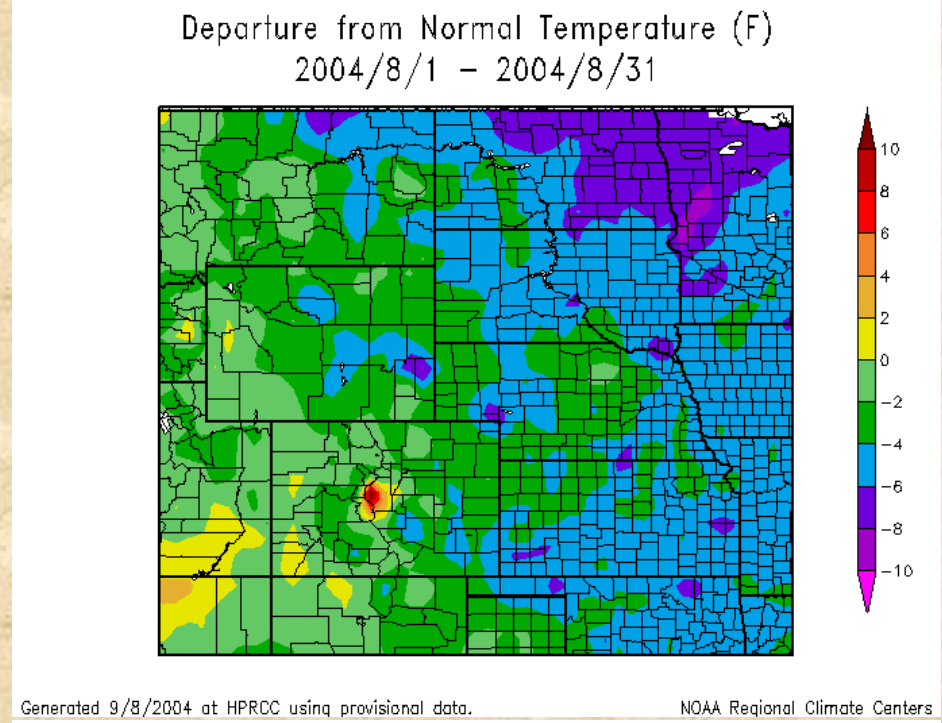
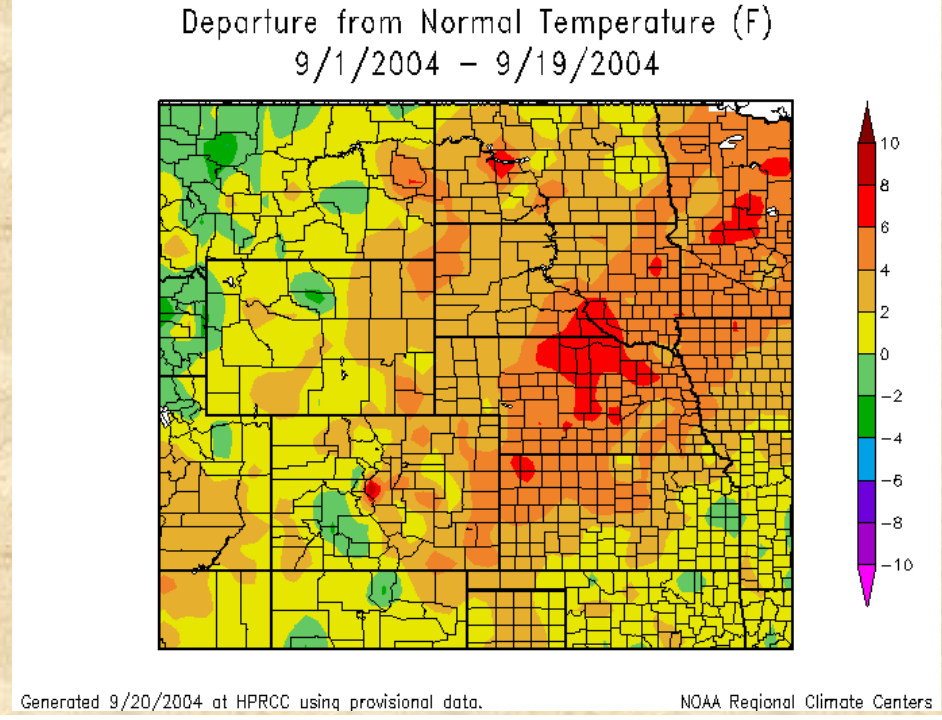
- **Recent climate anomalies**
- **ENSO: Status and Prospects**
- **CPC+ forecasts for October '04 thru March '05**
- **Experimental forecasts (OCT'04 - MAR'05)**
- **Executive Summary**



Recent Moisture

- August continued where July left off: wet in most of eastern CO, and dry towards the Four Corners.
- The first two thirds of September have been quite dry over the Front Range, letting the fire danger rise yet again (see Friday's events in Boulder County), while beneficial tropical moisture favored Western Colorado.

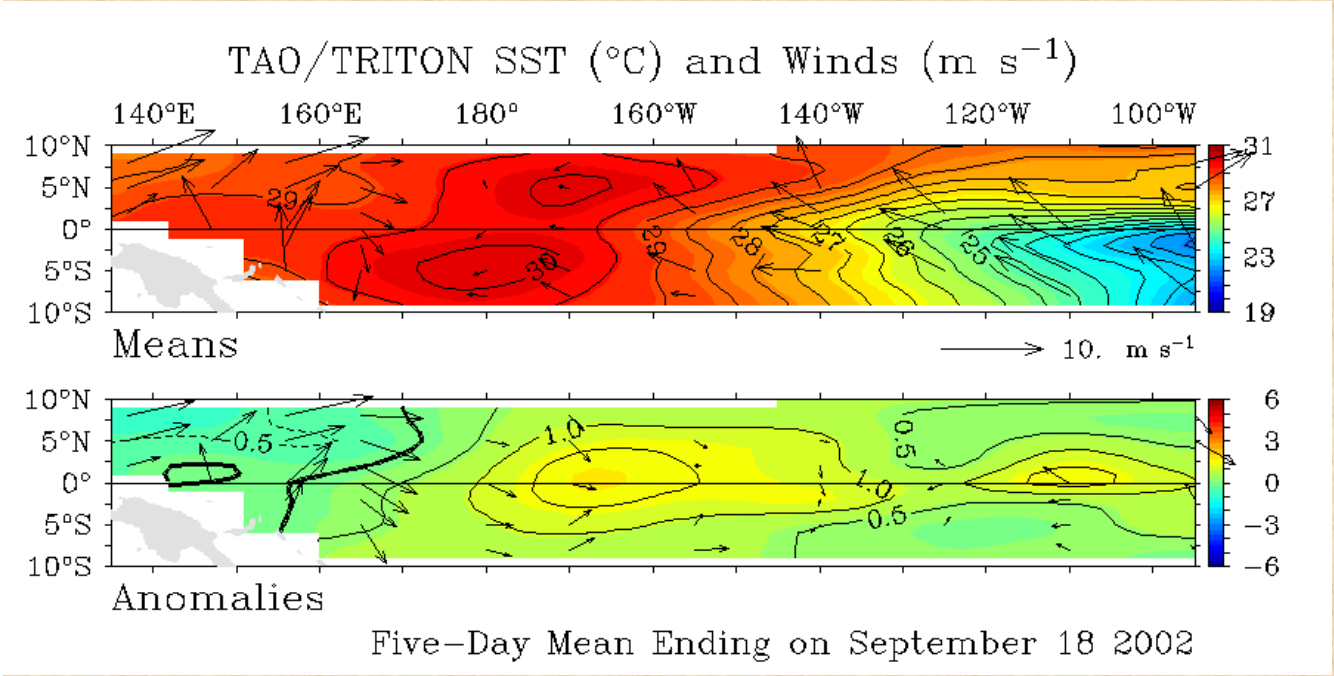


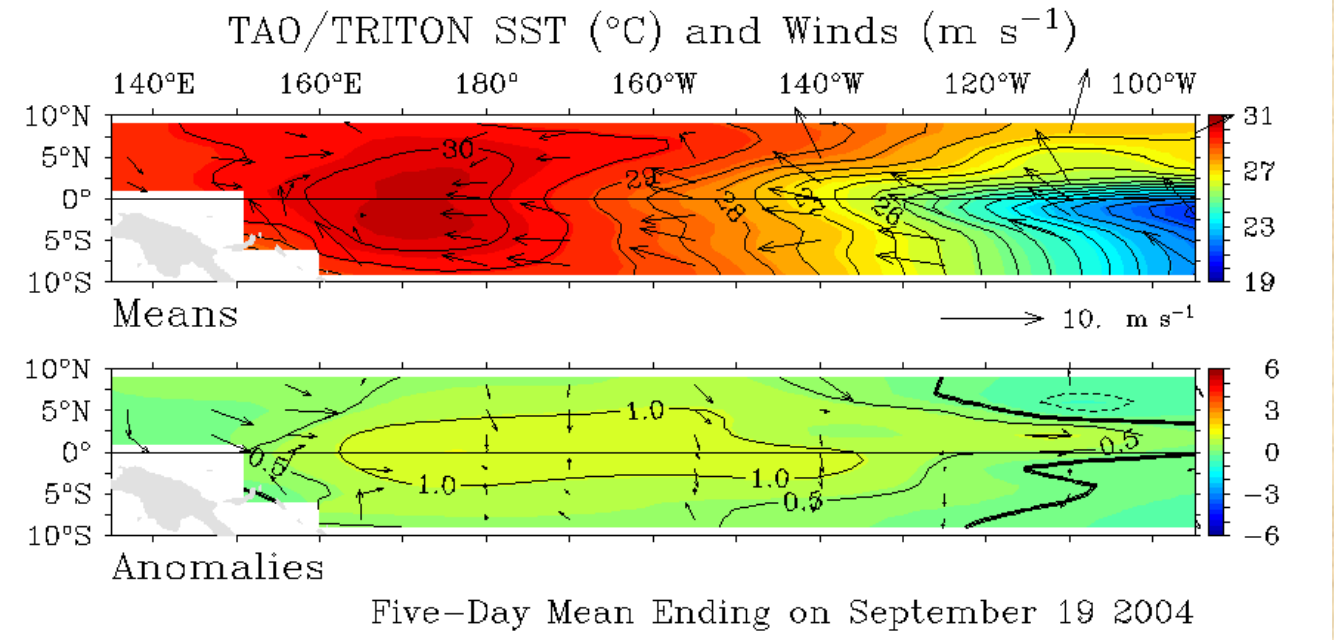


Recent temperatures

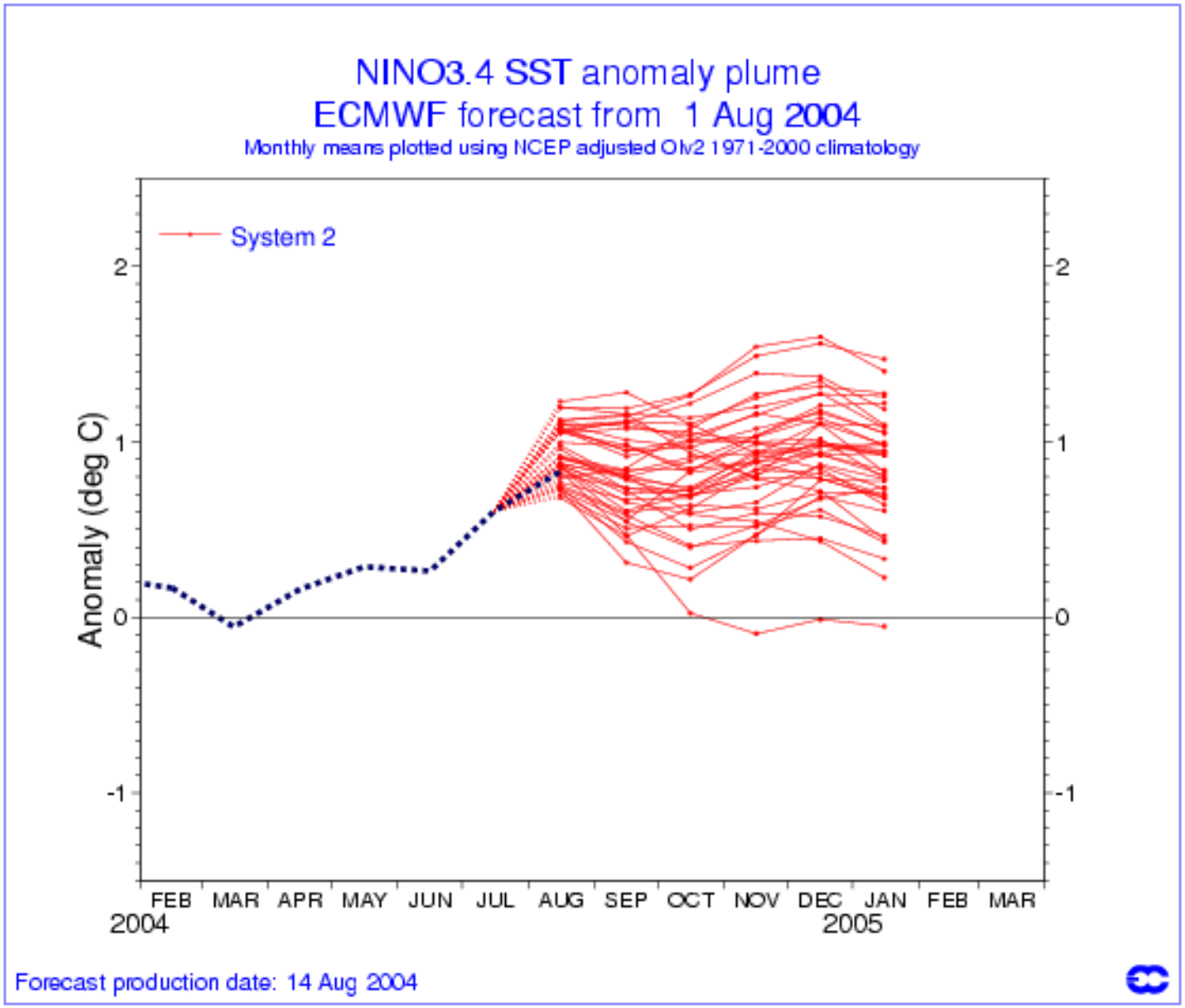
- August was cooler than normal over most of CO, continuing an abnormally cold summer (Boulder had its 3rd wettest as well as its 3rd coldest summer on record);
- September has been in the inverse regime until early this week, but the remainder of this week should be cold over Colorado.

Source: *http://www.hprcc.unl.edu/products/current.html*

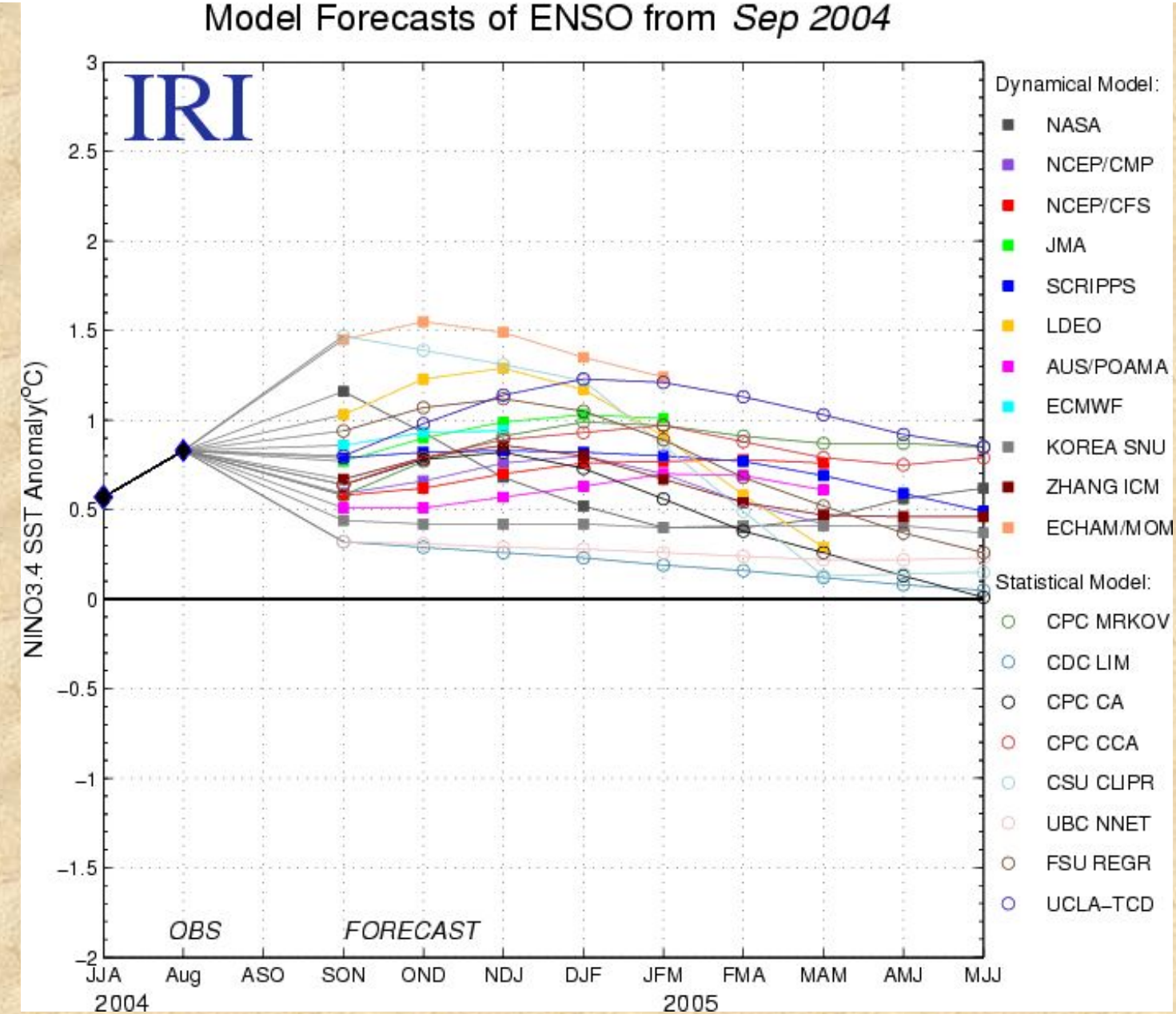




Current state of ENSO compared to two <u>years</u> ago - El Niño has made a comeback, albeit weaker than in 2002!

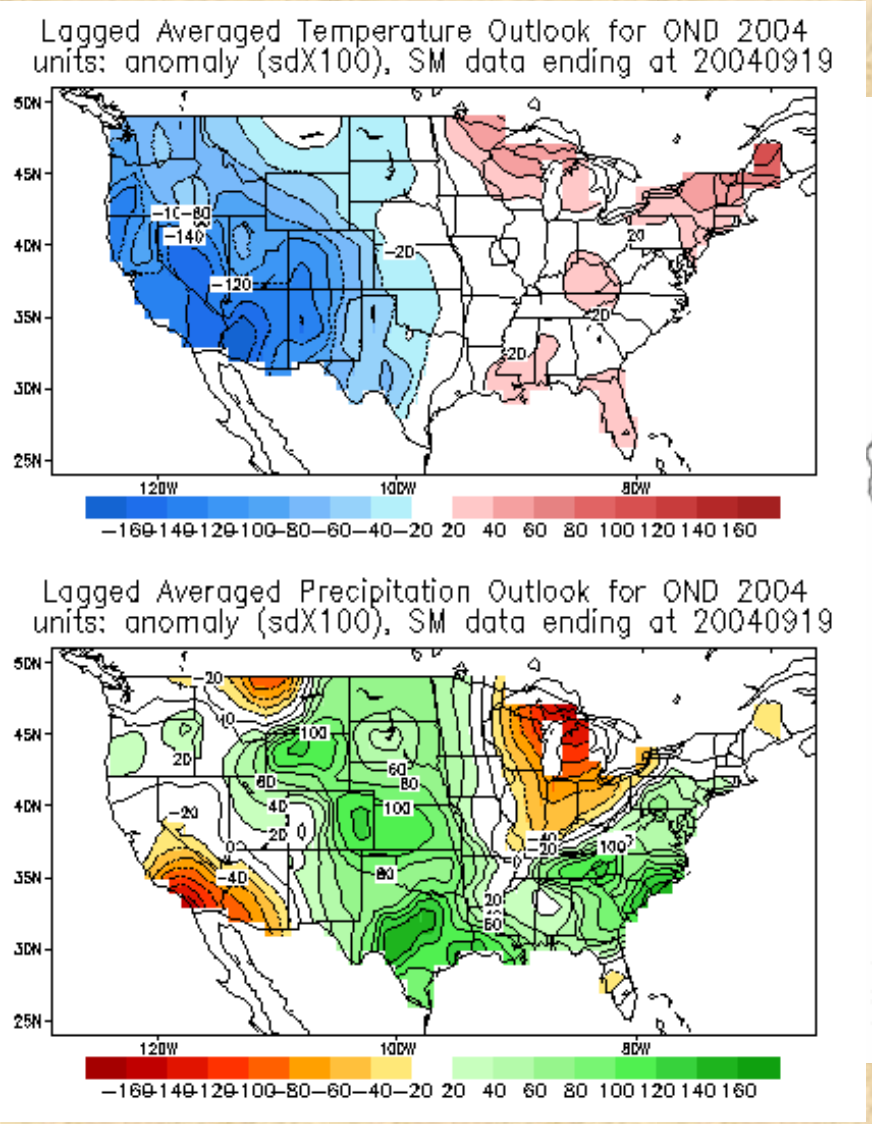


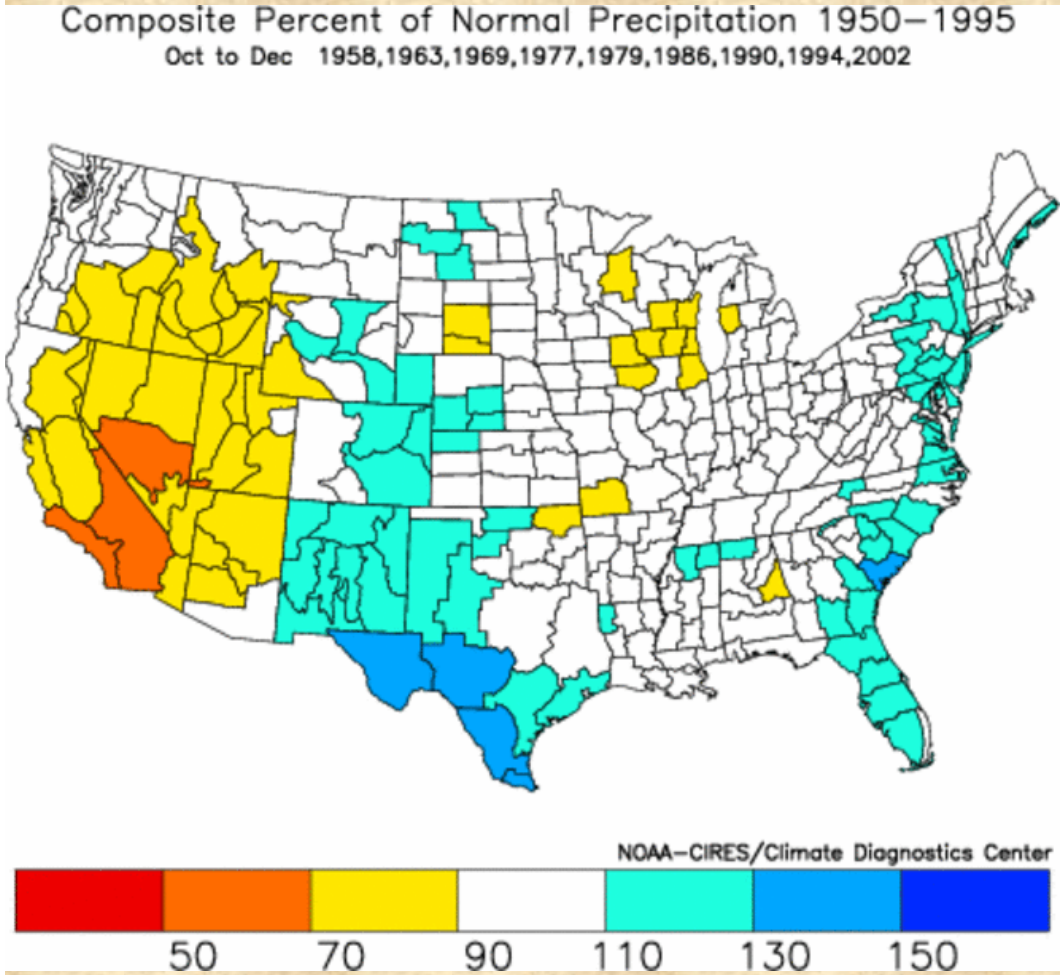
ECMWF forecast from last month (plus August verification): Moderate El Niño conditions into early winter!



ENSO forecasts from 11 numerical and 8 statistical forecast models: persistence hard to beat into early next year!

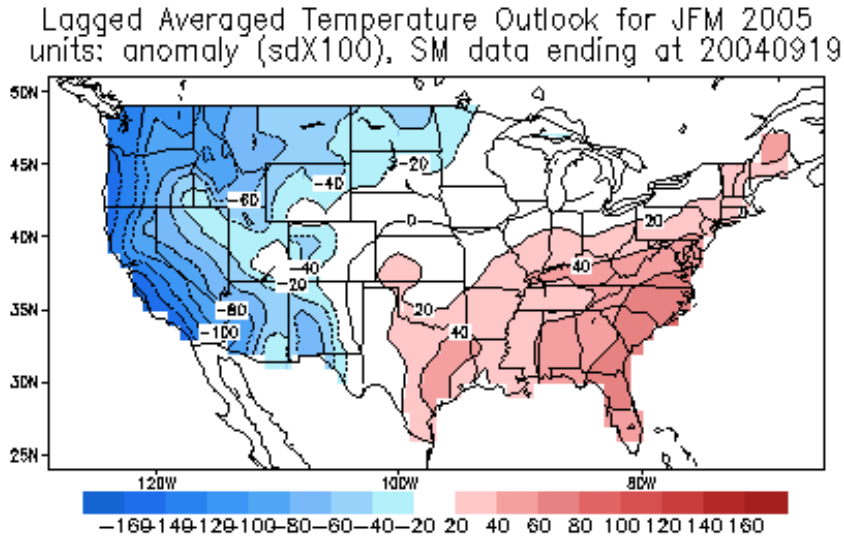
Soil Moisture Analog vs. Moderate El Niño "Forecasts"

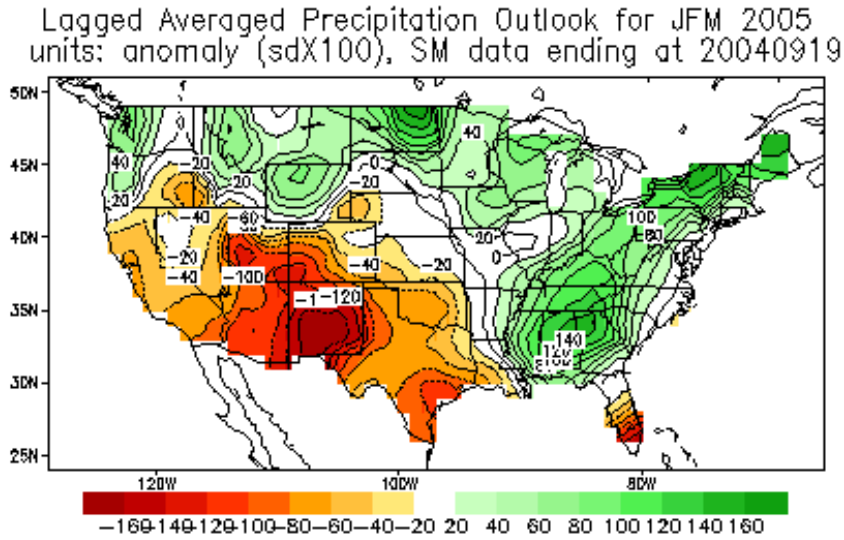


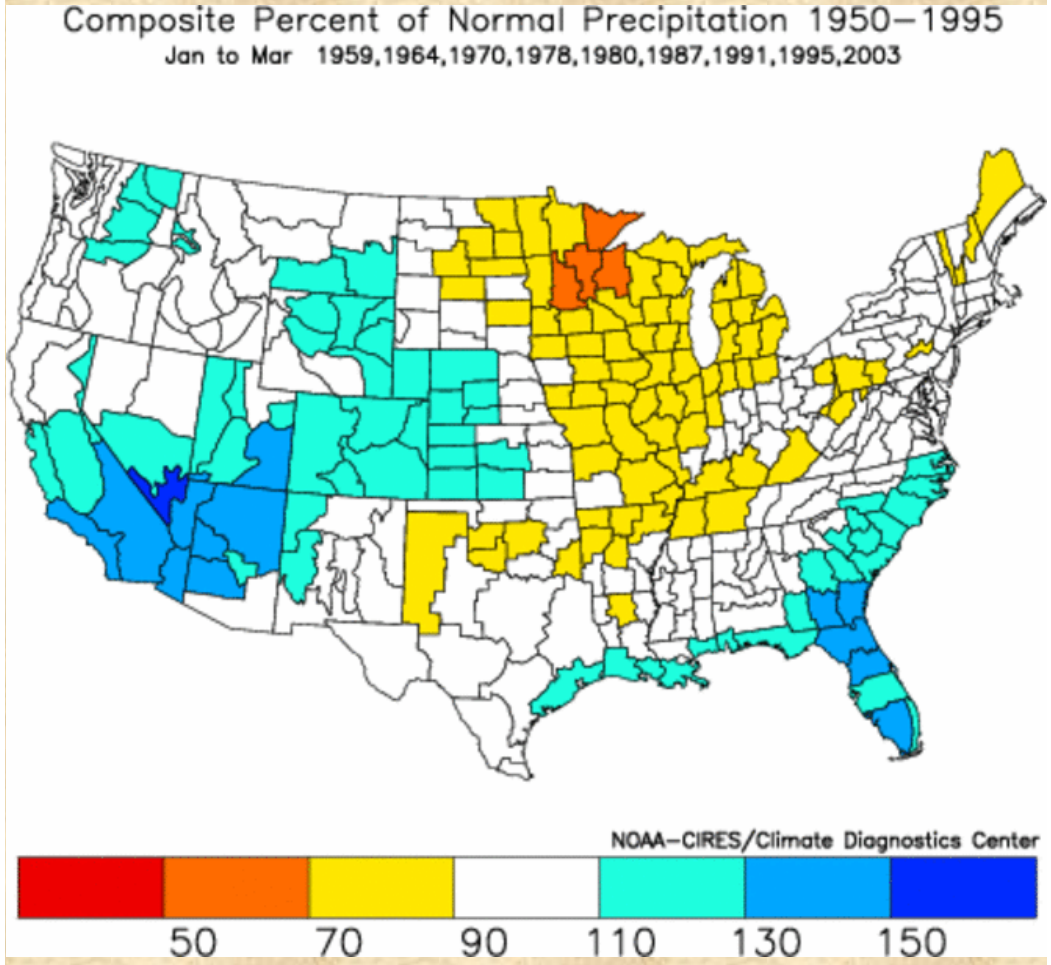


For Oct-Dec'04, both tools predict renewed wet conditions over eastern CO, with the caveat that historical skill is weaker with moderate El Niños than with stronger ones.

Soil Moisture Analog vs. Moderate El Niño "Forecasts"

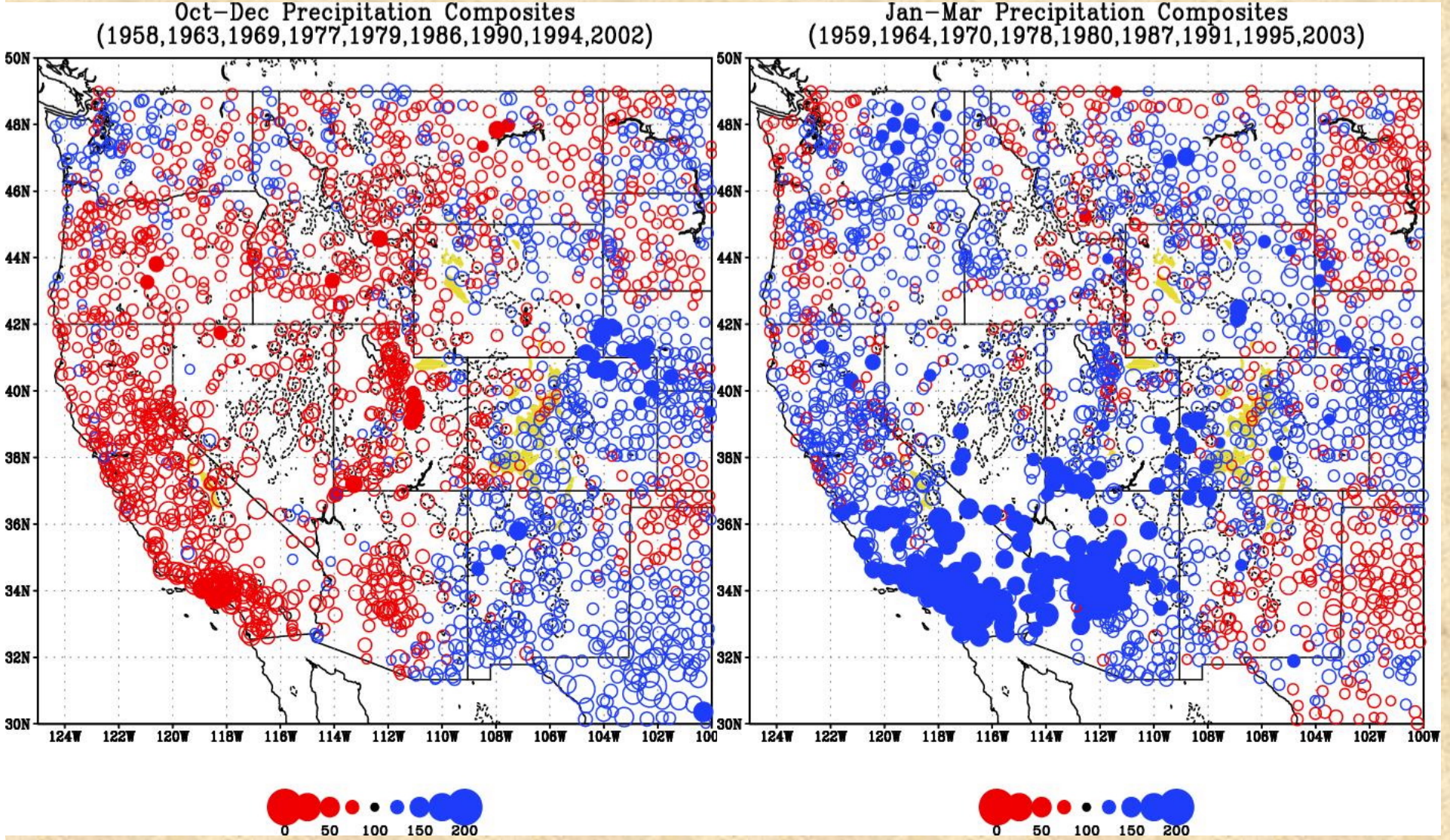




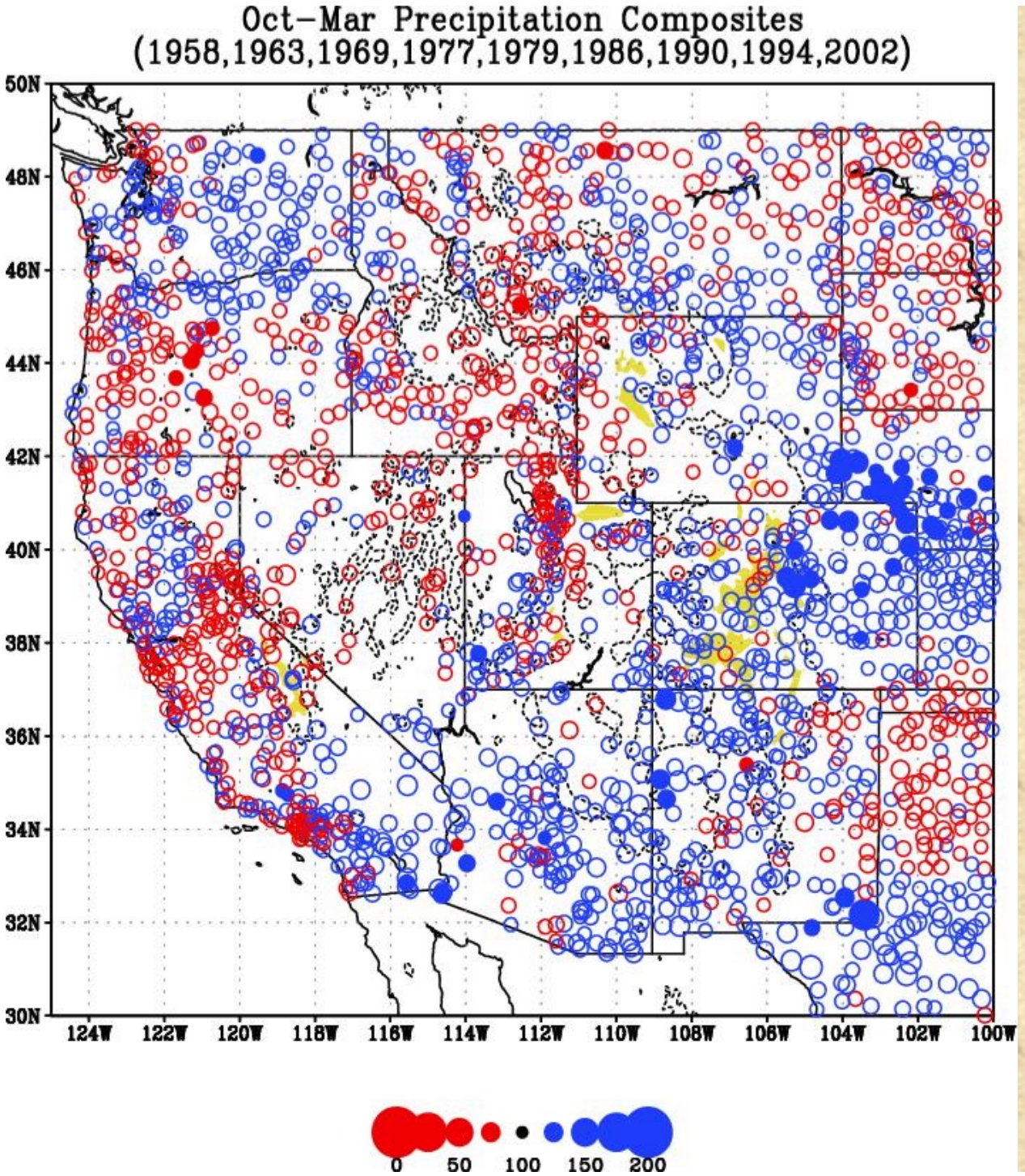


For Jan-Mar'05, moderate El Niño composites continue an optimistic trend for Colorado, while analog tools match historical La Niña rather than El Niño composites over the Western U.S.

Detailed Moderate / “Late Blooming” El Niño Composites

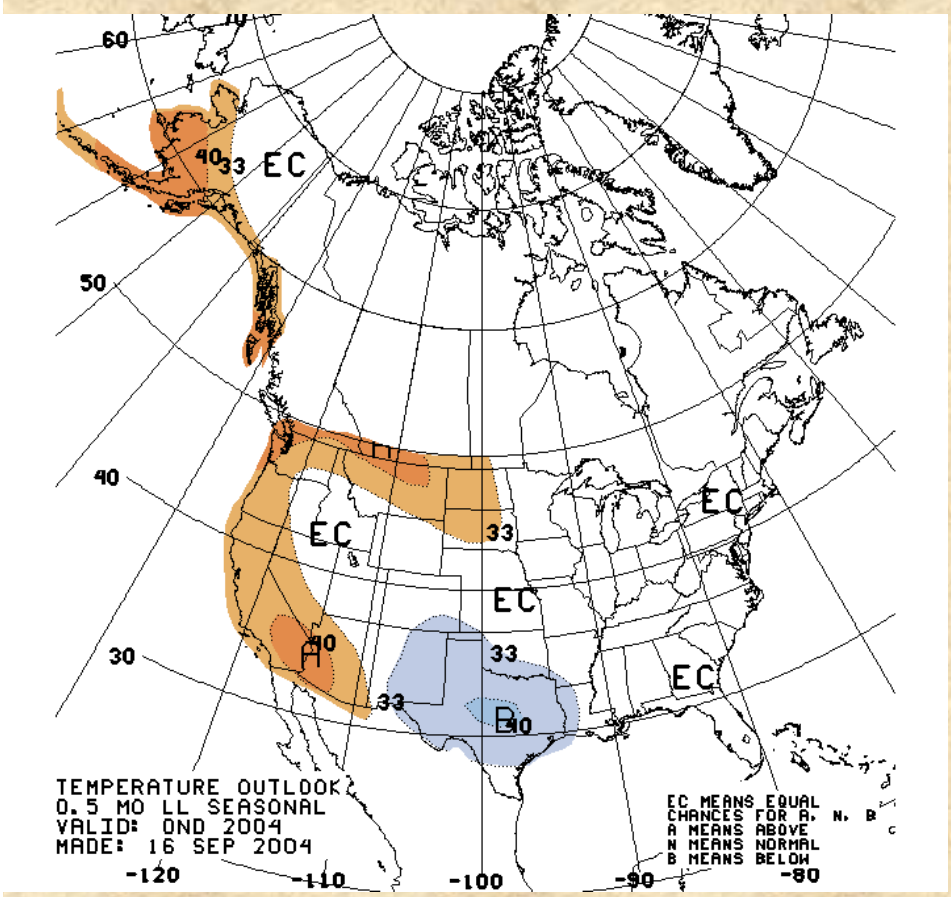


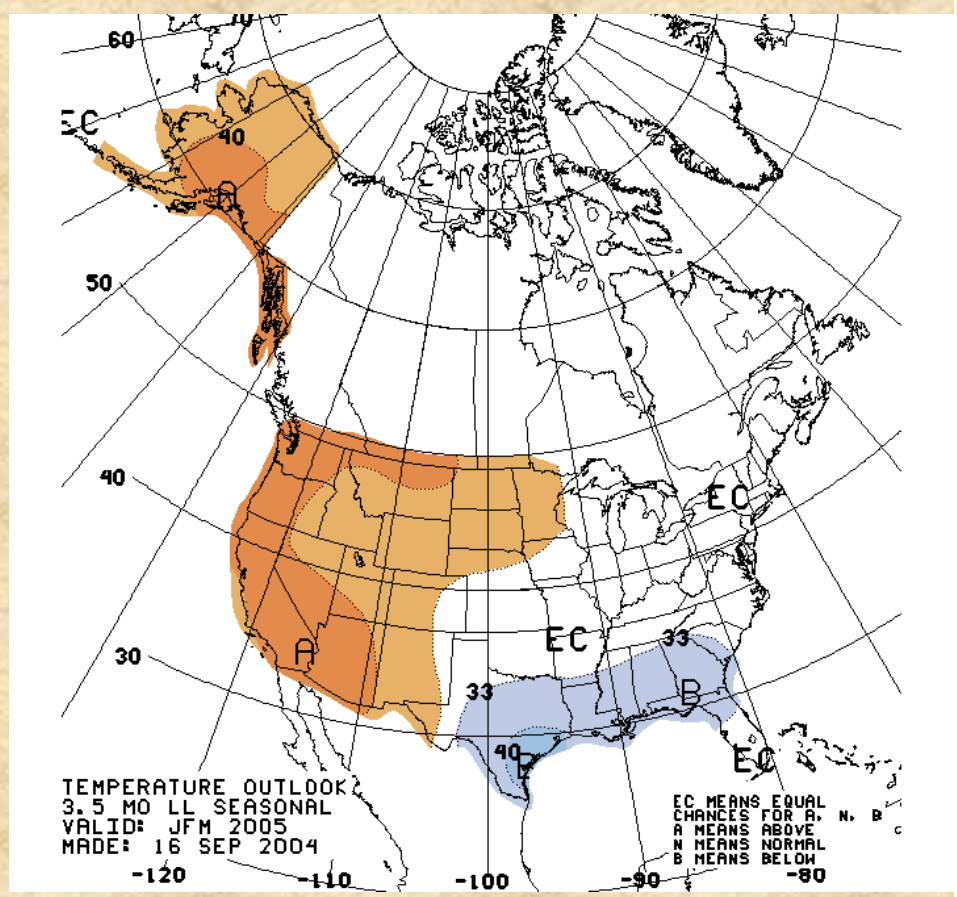
A station-by-station analysis for the nine moderate / late-blooming El Niño composite cases shows that northeast Colorado benefits the most in the late fall season, while southern CA into SW CO have the best odds for increased precipitation in late winter. Solid circles represent statistically significant results.



Moderate / "Late Blooming" El Niño summary for next six months: <u>good</u> news for northeast CO, in particular Front Range cities, but no big tilt one way or the other for the rest of CO. <u>Bad</u> news: north-central mountain valleys hint at a slightly negative tilt in Oct'04-Mar'05.

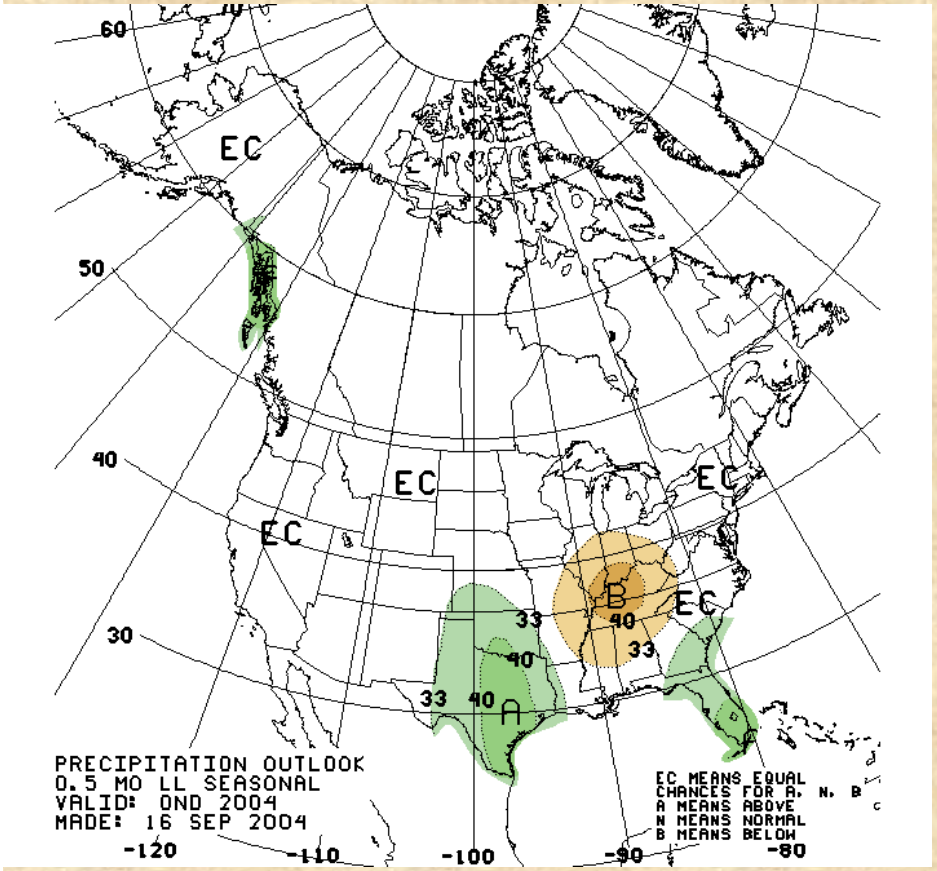
Temperature Forecasts (CPC)

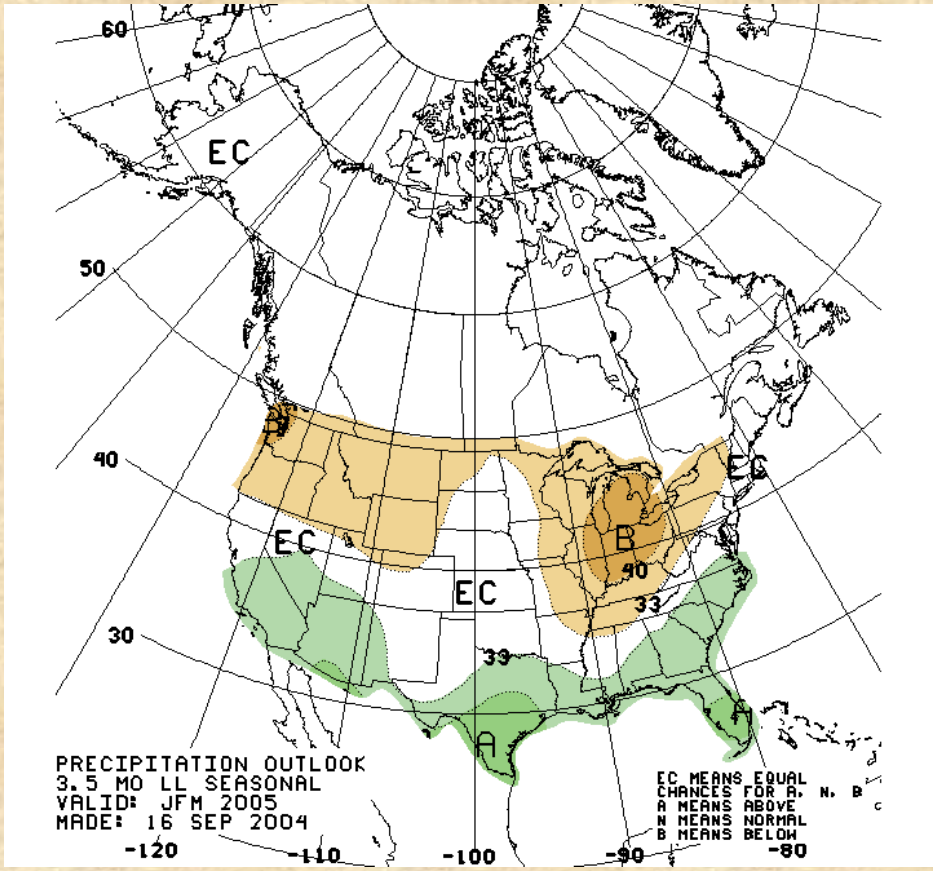




According to CPC, the upcoming fall and winter seasons have a better-than-average chance of being warmer than normal both to our north and southwest, while Texas and adjacent regions may be colder-than-normal during late fall in particular.

Precipitation Forecasts (CPC)

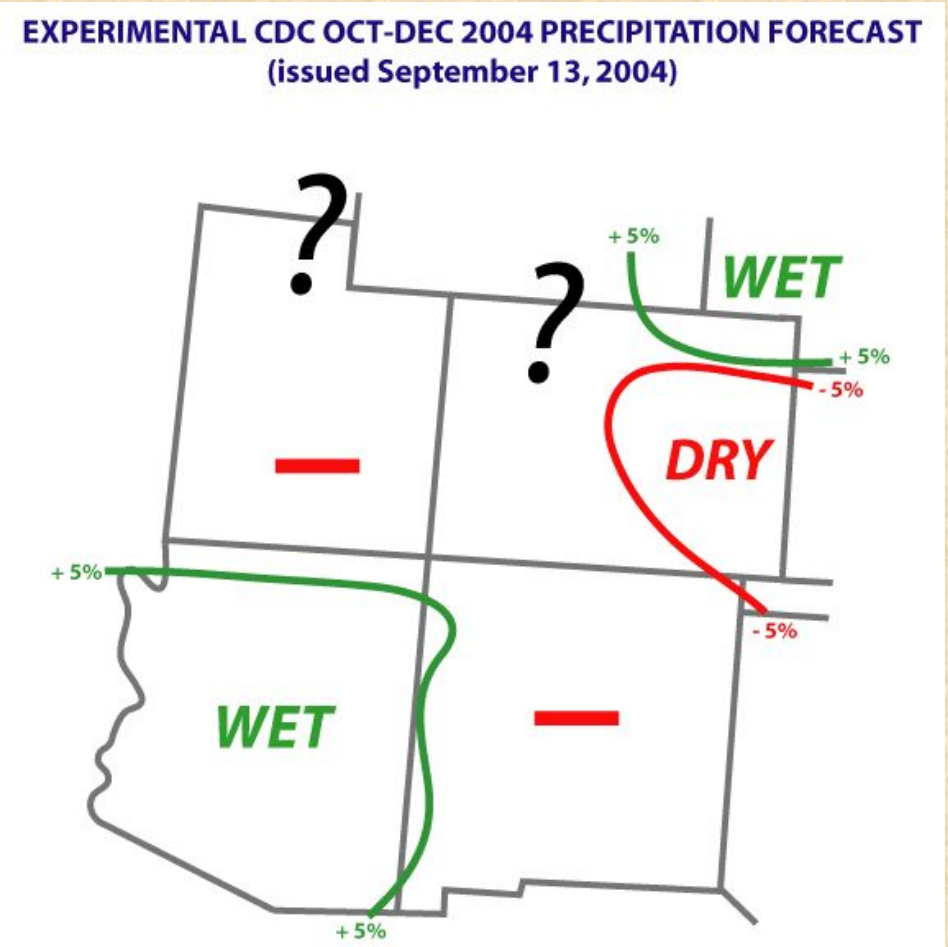


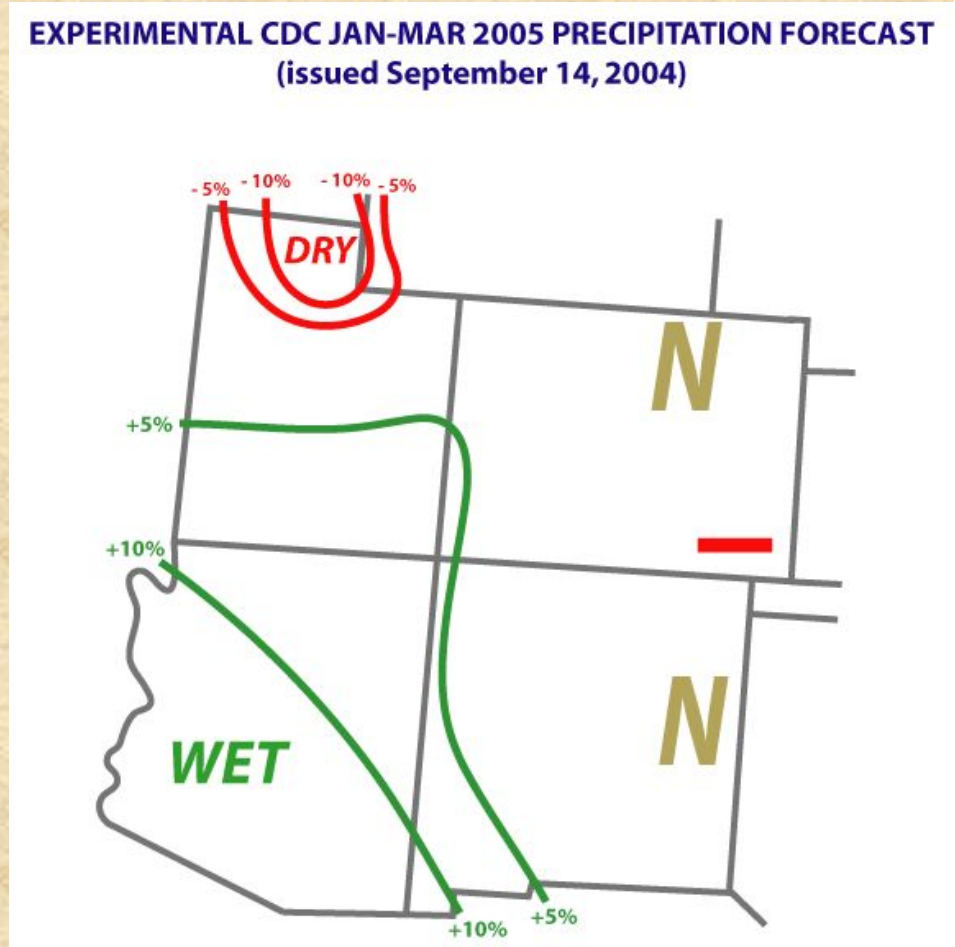


The CPC forecast for OCT-DEC'04 has increased precipitation odds over TX and FL, while CO and states to the south and west fall under climatological odds ("EC"). During JAN-MAR'05, the CPC forecast highlights a risk of drier-than-normal conditions over the NW U.S., including NW CO, while keeping wetter-than-normal odds to our southwest.

Source (for CPC forecasts): *http://www.cpc.ncep.noaa.gov/products/forecasts/*

Experimental CDC Forecasts





For OCT-DEC '04, better-than-average odds for a wet season are confined to AZ and NE CO, while east-central and southeastern CO have similar odds for a dry fall. None of these shifts in the odds is statistically significant. For JAN-MAR'05, increased odds for a wet season reach significant levels in AZ, while the reverse odds for a dry late winter peak over the Wasatch mountains of UT. Both NE CO and E NM feature increased odds of near-normal precipitation in late winter. The resemblance of these forecast maps with El Niño composites is not accidental. Source: *http://www.cdc.noaa.gov/people/klaus.wolter/SWcasts/*

Executive Summary (21 September 2004)

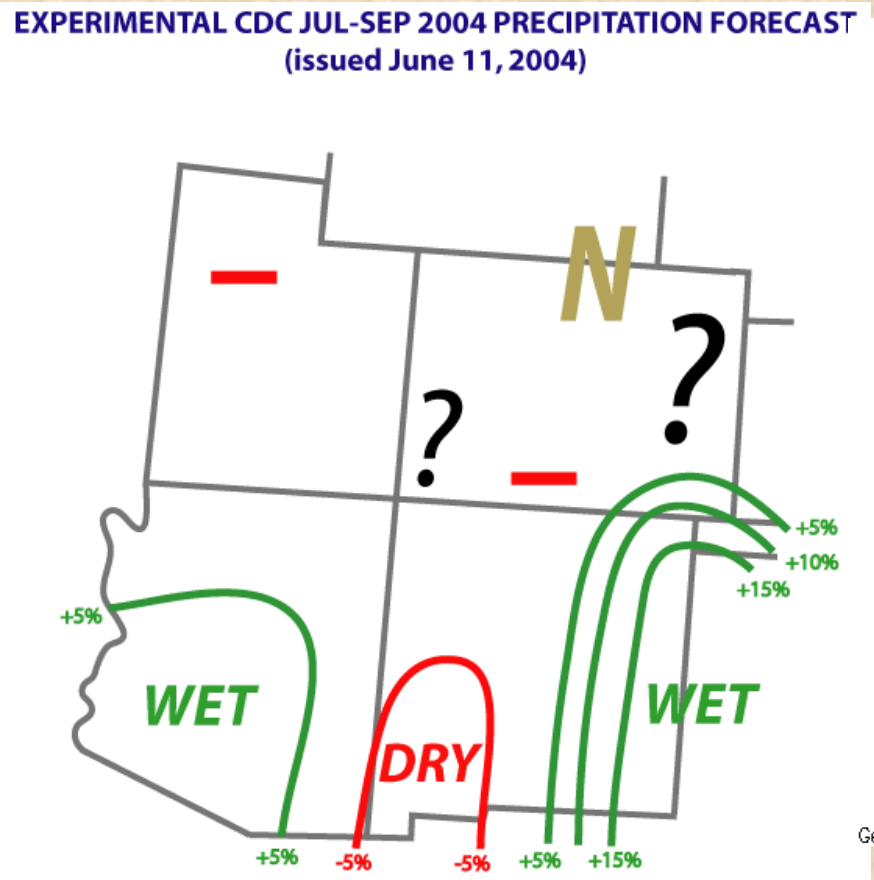
1. The 2002-03 El Niño event ended more than a year ago. Over the last four months, the tropical Pacific has warmed yet again, and a fledgling new El Niño event has indeed developed. The current event will probably stay weaker than the one two years ago.

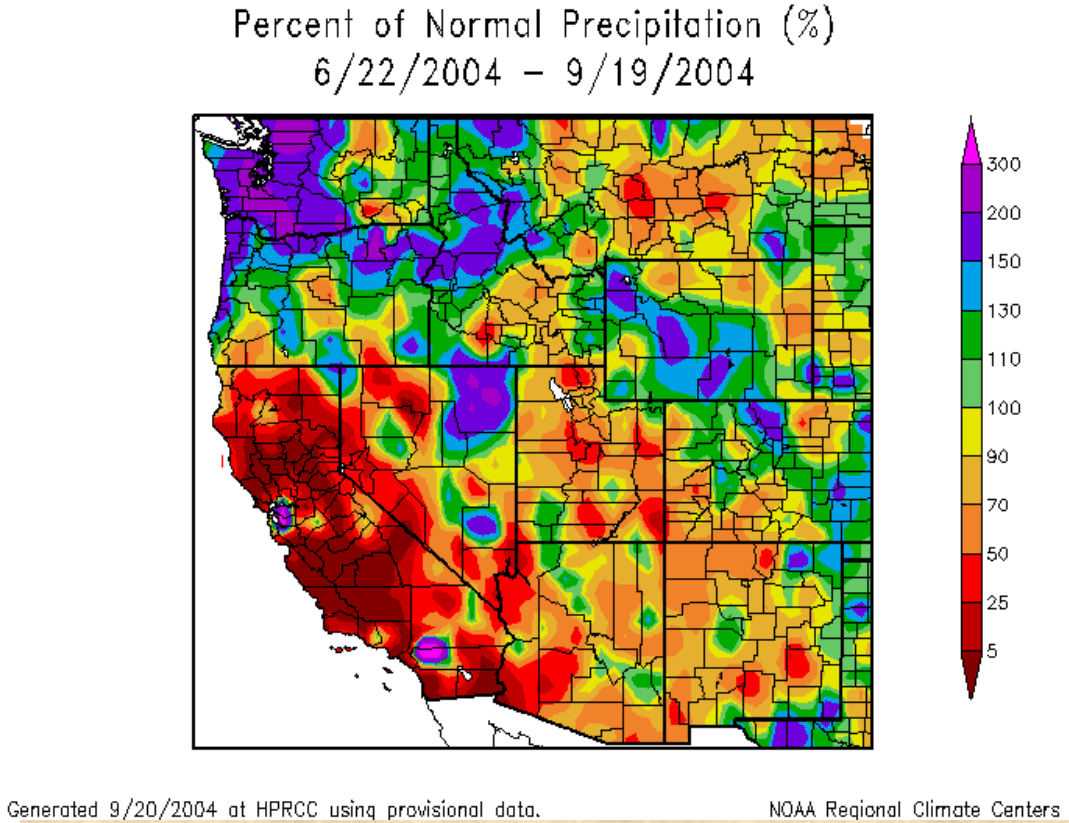
2. After a mixed spring (dry March, wet April, dry May), our summer ended up being quite wet and cool in the EASTERN half of Colorado, while drought conditions continued west of here, in particular near the Four Corners region. September rains have mitigated this situation somewhat over western Colorado.

5. In my experimental forecasts for Oct-Dec '04, better-than-average odds for a wet season are confined to Arizona and northeast Colorado, while east-central and southeastern CO are under a modest threat of a dry fall. For Jan-Mar '05, the odds for a wet season reach significant levels in AZ, while the reverse odds (for dry) peak over northern Utah. Both NE CO and E NM feature increased odds of near-normal precipitation in late winter.

6. Bottomline: Recent warming in the central equatorial Pacific has allowed for the return of El Niño conditions. In the foreseeable future, tilts in the precipitation odds remain weak over much of Colorado. If El Niño were to continue to grow this fall, most of Colorado would improve its odds for above-normal moisture for the remainder of 2004, and for next spring in particular.

Preliminary verification for July-September 2004





For JUL-SEP '04, the forecast favored Arizona and especially eastern NM into SE CO. The preliminary verification for the last 90 days depicts increased moisture from SE NM all the way to NE CO, a tendency for drier than normal rainfall over UT, south-central CO and SW NM, while increased moisture in AZ was confined to the Mogollan rim due to recent moisture plumes from the eastern tropical Pacific.